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- 1 1. A video mail server comprising:
  - 2 a video call signaling module coupled to an internet protocol network via an
  - 3 internet protocol services module for:
    - 4 establishing a first internet protocol channel with a caller remote internet
    - 5 video device to support a recording session over the internet protocol network; and
    - 6 establishing a second internet protocol channel with a user remote internet
    - 7 video device to support a playback session over the internet protocol network;
    - 8 a media interface coupled to the internet protocol network via the internet
    - 9 protocol services module and comprising:
      - 10 a recording module for obtaining a recording sequence of compressed
      - 11 images representing motion video from the caller remote internet video device and
      - 12 storing a video mail file representing the recording sequence of compressed images in a
      - 13 storage; each compressed image frame within the video mail file being one of:
        - 14 an independent frame from which a video image frame can be
        - 15 recovered utilizing only the independent frame; and
        - 16 a dependent frame from which the video image frame can only be
        - 17 recovered utilizing both the dependent frame and an independent frame preceding the
        - 18 dependent frame in the sequence;
        - 19 a play back module for retrieving the video mail file and transferring
        - 20 contents of the video mail file as the playback sequence of compressed images to the
        - 21 user remote internet video device.

- 1 2. The video mail server of claim 1, further comprising:
  - 2 a video codec coupled to the media interface and comprising a decoder module
  - 3 and an encoder module;
  - 4 the decoder module:
    - 5 receiving the recording sequence of compressed images from the
    - 6 recording module; and

7 decoding the recording sequence of compressed images to generate  
8 motion video images;  
9 the encoder module:  
10 encoding the motion video images into the playback sequence of  
11 compressed images, the playback sequence of compressed images being in a robust  
12 format that requires that at least one independent frame be included within each fixed  
13 time duration; and  
14 transferring the playback sequence of compressed images to the media  
15 interface for storing as the video mail file.  
16

1 3. The video mail server of claim 2, wherein  
2 wherein the robust format requires that the duration of time between each  
3 independent frame be a fixed period of time on the order of one second.  
4

1 4. The video mail server of claim 1:  
2 wherein the video mail file comprises the recording sequence of compressed  
3 images; and  
4 wherein the video mail server further comprises:  
5 a video codec coupled to the media interface and comprising a decoder  
6 module and an encoder module, the decoder module:  
7 receiving the recording sequence of compressed images from the  
8 playback module;  
9 decoding the recording sequence of compressed images to generate  
10 motion video images; and  
11 the encoding module:  
12 generating the playback sequence of compressed images; and  
13 transferring the playback sequence of compressed images to the media  
14 interface for transferring to the user remote internet device.  
15

1 5. The video mail server of claim 4:

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2 wherein the playback sequence of compressed images is in a robust format that  
3 requires that at least one independent frame be included within each fixed time  
4 duration.

5  
1 6. The video mail server of claim 5, wherein the robust format requires that the  
2 duration of time between each independent frame be a fixed period of time on the order  
3 of one second.

1 7. The video mail server of claim 4, wherein:  
2 the playback module receives a lost frame message from the user remote  
3 internet video device when the user remote internet video device detects loss of a frame  
4 within the playback sequence of compressed images; and  
5 video codec:  
6 compresses a next image frame of the motion video images as an  
7 independent frame in response to the playback module receiving a lost frame message  
8 ; and  
9 includes the next image frame in the playback sequence of compressed  
10 images.

11  
1 8. The video mail server of claim 1:  
2 wherein the video mail file comprises the recording sequence of compressed  
3 images;  
4 wherein the video mail server further comprises:  
5 a video codec coupled to the media interface and comprising a decoding  
6 module and an encoding module, the decoding module:  
7 receiving the recording sequence of compressed images from the  
8 playback module;  
9 decoding the recording sequence of compressed images to generate  
10 motion video images; and  
11 queuing each motion video image for encoding, by the encoding module,

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12 as a lost frame correction frame; and  
13 wherein the playback module comprises  
14 a delay buffer for delaying the playback sequence of compressed images  
15 for a period of time such that each frame within the playback sequence of compressed  
16 images is queued for sending to the user remote internet device at a time that  
17 corresponds to the motion video image queued for encoding by the encoding module as  
18 a lost frame correction frame such that a lost frame correction frame may be substituted  
19 for a frame in the playback sequence of compressed images in response to receiving an  
20 lost frame message.

1 9. The video mail server of claim 1, wherein:  
2 wherein the call signaling module establishes the second internet protocol  
3 channel over a TCP/IP connection;  
4 the internet protocol services module operates TCP/IP protocols to effect re-  
5 transmission of any lost TCP/IP frames on the second TCP/IP connection; and  
6 and the playback sequence of compressed images is the same as recording  
7 sequence of compressed images.

1 10. The video mail server of claim 9, wherein:  
2 wherein the call signaling module further establishes first internet protocol  
3 channel over a TCP/IP connection; and  
4 the internet protocol services module further operates TCP/IP protocols to effect  
5 re-transmission of any lost TCP/IP frames on the first TCP/IP connection; and  
6

1 11. The video mail server of claim 1:  
2 wherein the call signaling module establishes the first internet protocol channel  
3 over a TCP/IP connection and establishes the second internet protocol channel over a  
4 UDP/IP channel;  
5 wherein the internet protocol services module operates TCP/IP protocols to effect  
6 re-transmission of any lost TCP/IP frames on the first internet protocol channel;  
7 wherein the video mail file comprises the recording sequence of compressed

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- 8 images: and
- 9 wherein the video mail server further comprises:
- 10 a video codec coupled to the media interface and comprising a decoder
- 11 module and an encoder module, the decoder module:
- 12 receiving the recording sequence of compressed images from the
- 13 playback module;
- 14 decoding the recording sequence of compressed images to generate
- 15 motion video images;
- 16 generating the playback sequence of compressed images; and
- 17 transferring the playback sequence of compressed images to the media
- 18 interface for transferring to the user remote internet device.
- 19
- 1 12. The video mail server of claim 11, wherein the playback sequence of
- 2 compressed images is in a robust format that requires that at least one independent
- 3 frame be included within each fixed time duration.
- 1 13. The video mail server of claim 12, wherein the robust format requires that the
- 2 duration of time between each independent frame be a fixed time interval on the order
- 3 of one second.
- 4
- 1 14. The video mail server of claim 11, wherein:
- 2 the playback module receives a lost frame message from the user remote
- 3 internet video device when the user remote internet video device detects frame loss;
- 4 and
- 5 the video codec:
- 6 compresses a next image frame of the motion video images as an
- 7 independent format in response to the playback module receiving a lost frame
- 8 message; and
- 9 includes the next image frame in the playback sequence of compressed
- 10 images.

- 1 15. The video mail server of claim 1:  
2 wherein the call signaling module establishes the first internet protocol channel  
3 over a TCP/IP connection and to establish the second internet protocol channel over a  
4 UDP/IP channel;  
5 wherein the internet protocol services module operates TCP/IP protocols to effect  
6 re-transmission of any lost TCP/IP frames on first TCP/IP connection;  
7 wherein the video mail file comprises the recording sequence of compressed  
8 images:  
9 wherein the video mail server further comprises a video codec coupled to the  
10 media interface and comprising a decoder module and an encoder module;  
11 the decoder module:  
12 receiving the recording sequence of compressed images from the  
13 playback module;  
14 decoding the recording sequence of compressed images to generate  
15 motion video images;  
16 queuing each motion video image for encoding as an error correction  
17 frame; and  
18 wherein the playback module comprises:  
18 wherein the playback module comprises:  
19 a delay buffer for delaying the playback sequence of compressed images  
20 for a period of time such that each frame within the playback sequence of compressed  
21 images is queued for sending to the user remote internet device at a time that  
22 corresponds to the video image frame queued for encoding by the encoding module as  
23 a lost frame correction frame such that the lost frame correction frame may be  
24 substituted for a frame in the playback sequence of compressed images in response to  
25 receiving a lost frame message.  
26
- 1 16. A method of recording and playing back video mail, the method comprising:  
2 establishing a first internet protocol channel with a caller remote internet video  
3 device to support a recording session over the internet protocol network;

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4 establishing a second internet protocol channel with a user remote internet video  
5 device to support a playback session over the internet protocol network;  
6 obtaining a recording sequence of compressed images from the caller remote  
7 internet video device;  
8 storing a video mail file representing the recording sequence of compressed  
9 images in a storage; each compressed image frame within the video mail file being one  
10 of:  
11 an independent frame from which an image frame can be recovered  
12 utilizing only the independent frame; and  
13 a dependent frame from which the image frame can only be recovered  
14 utilizing both the dependent frame and an independent frame preceding the dependent  
15 frame in the sequence;  
16 retrieving the video mail file and transferring contents of the video mail file as the  
17 playback sequence of compressed images to the user remote internet video device.

1 17. The method of claim 16, further comprising:

2 decoding the recording sequence of compressed images to generate motion  
3 video images;

4 encoding the motion video images into the playback sequence of compressed  
5 images, the playback sequence of compressed images being in a robust format that  
6 requires that at least one independent frame be included within each fixed time  
7 duration; and

8 storing the playback sequence of compressed images as the video mail file.  
9

1 18. The method of claim 17, wherein the robust format requires that the duration of  
2 time between each independent frame be a fixed period of time on the order of one  
3 second.

1 19. The method of claim 16 wherein:

2 the video mail file comprises the recording sequence of compressed images; and

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3           the method further comprises:  
4                 decoding the recording sequence of compressed images to generate  
5 motion video images; and  
6                 encoding the motion video images to generating the playback sequence of  
7 compressed images; and  
8                 transferring the playback sequence of compressed images to the user  
9 remote internet device.

10

1   20.   The method of claim 19, wherein the playback sequence of compressed images  
2 comprises is in a robust format that requires that at least one independent frame be  
3 included within each fixed time duration.

4

1   21.   The method of claim 20, wherein the robust format requires that the duration of  
2 time between each independent frame be a fixed period of time on the order of one  
3 second.

1   22.   The method of claim 19, further comprising:  
2           receiving a lost frame message from the user remote internet video device when  
3 the user remote internet video device detects loss of a frame within the playback  
4 sequence of compressed images;  
5           compressing a next image frame of the motion video images as an independent  
6 frame in response to receiving an lost frame message; and  
7           including the next image frame in the playback sequence of compressed images.

8

1   23.   The method of claim 16, wherein:  
2           the video mail file comprises the recording sequence of compressed images; and  
3           the method further comprises:  
4                 decoding the recording sequence of compressed images to generate  
5 motion video images;  
6                 queuing each motion video image for encoding as a lost frame correction



7 frame; and

8                   delaying the playback sequence of compressed images for a period of  
9 time such that each frame within the playback sequence of compressed images is  
10 queued for sending to the user remote internet device at a time that corresponds to the  
11 motion video image queued for encoding as a lost frame correction frame such that an  
12 lost frame correction frame may be substituted for a frame in the playback sequence of  
13 compressed images in response to receiving an lost frame message.

14

1 24. The method of claim 16, wherein the method further includes:

2           establishing each of the second internet protocol channel over a TCP/IP  
3 connection; and

4           and the playback sequence of compressed images is the same as recording  
5 sequence of compressed images.

6

1 25. The method of claim 24, wherein the method further includes:

2           establishing each the first internet protocol channel over a TCP/IP connection.

1 26. The method of claim 16, wherein :

2           the video mail file comprises the recording sequence of compressed images; and  
3           the method further includes:

4                   establishing the first internet protocol channel over a TCP/IP connection  
5 and establishing the second internet protocol channel over a UDP/IP channel;

6                   decoding the recording sequence of compressed images from the video  
7 mail file to generate motion video images;

8                   encoding the motion video images to generate the playback sequence of  
9 compressed images; and

10                  transferring the playback sequence of compressed images to the user  
11 remote internet device.

12

1 27. The method of claim 26, wherein the playback sequence of compressed images

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2 is in a robust format that requires that at least one independent frame be included within  
3 each fixed time duration.

1 28. The method of claim 27, wherein the robust format requires that the time duration  
2 between each independent frame be a fixed period of time on the order of one second.

1 29. The method of claim 26, wherein the method further comprises:  
2 receiving a lost frame message from the user remote internet video device when  
3 the user remote internet video device detects loss of a frame within the play back  
4 sequence of compressed images;  
5 compressing a next image frame in the sequence of motion video images as an  
6 independent frame in response to receiving an lost frame message; and  
7 including the next image frame in the play back sequence of compressed  
8 images.

1 ~~30~~  
2 ~~31~~. The method of claim 16 wherein:  
3 the video mail file comprises the recording sequence of compressed images; and  
4 the method further comprises:  
5 establishing the first internet protocol channel over a TCP/IP connection and to  
6 establish the second internet protocol channel over a UDP/IP channel;  
7 decoding the recording sequence of compressed images to generate motion  
8 video image;  
9 queuing each motion video image for encoding as a lost frame correction frame;  
10 and  
11 delaying the playback sequence of compressed images for a period of time such  
12 that each frame within the playback sequence of compressed images is queued for  
13 sending to the user remote internet device at a time that corresponds to the motion  
14 video image queued for encoding as a lost frame correction frame such that an lost  
15 frame correction frame may be substituted for a frame in the playback sequence of  
compressed images in response to receiving an lost frame message.

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